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STARVATION THREATENS RWANDA **"Seeds of Hope" Program to Restore its Crippled Agriculture**

Millions of Rwandans, their country wracked by civil war and ethnic genocide this year, face famine in 1995 unless Rwanda's destroyed seed supply is replenished before the next planting season, according to the Consultative Group on International Agricultural Research (CGIAR).

To help forestall this calamity, CGIAR has established **Seeds of Hope**, a program that is gathering seeds for Rwanda's main crops from CGIAR's centers around the globe and rushing them to Rwanda.

"Granaries have been looted and burned and seeds have been eaten by starving people throughout the country," says Ismail Serageldin, Chairman of CGIAR and Vice President of the World Bank's Office of Environmentally Sustainable Development. "Without seeds, Rwanda will not be able to plant next year, and will have no harvest. Farmers will become beggars and millions of people would again depend on outside food aid."

The destruction has been so widespread that many important local varieties of seeds have probably been wiped out. Similar disappearances of seed supplies occurred in Cambodia and Somalia during civil upheavals, but CGIAR centers were able to replace the seed bases of those countries from their gene banks. Now, unless suitable seeds come in from outside, many farmers in Rwanda would not even be able to replant during the upcoming crop seasons.

Initial efforts began in September and October of this year, when Rwandan farmers and "returnees" were given small amounts of seeds by non-governmental organizations (NGOs) and UN agencies.

With **Seeds of Hope**, CGIAR scientists are currently choosing and replicating seeds from their seed banks for varieties of Rwanda's main crops -- beans, maize, sorghum, sweet potato, potato, cassava and plantain -- that match what Rwandan farmers have long grown.

"The **Seeds of Hope** initiative shows how valuable scientific research can be in an emergency," says Mr. Serageldin. "CGIAR, because of its 25 years of gathering plant genetic resources from around the world, is the only international organization that could quickly replace Rwanda's seed base before the next planting season begins."

If successful, **Seeds of Hope** - funded by the World Bank, the United States, Switzerland, the United Kingdom, Canada, and Australia - will also make an expensive international relief effort -- rushing hundreds of thousands of tons of food from the developed world to Africa -- unnecessary. International agencies have been assisting Rwanda in meeting its food needs this year.

"It's not good enough to provide farmers with just any seed," says William Scowcroft, lead scientist on the project and deputy director general of the International Center for Tropical Agriculture (CIAT), which is in Colombia. "Rwandan farmers need the seed they had before, that are suited for their soil, their climate, which resist local pests and plant diseases, that taste like the beans, maize, sweet potatoes and plantains they are accustomed to eating."

The seeds are being provided by CGIAR Centers that have some 500,000 different samples of major food, forage and forest species in gene banks held in trust by the Centers for the world community. These genetic resources have supported the development of higher-yielding, more stable, pest and disease resistant varieties of staple foods consumed in the developing world.

The CGIAR is an association of 43 public and private sector donors jointly supporting 17 international agricultural research centers mostly located in developing countries. The CGIAR is cosponsored by the World Bank, the United Nations Development Programme (UNDP) and the Food and Agriculture Organization (FAO). Research at CGIAR Centers covers crops that provide 75 percent of food energy and protein requirements in developing countries.

CGIAR seeds are now being sent to Rwanda and neighboring nations -- Tanzania, Uganda, Burundi, Zaire, Ethiopia, Malawi and Kenya -- where nurseries are being set up to grow huge volumes of the seeds that will then be transported overland.

CGIAR itself does not have the capacity to distribute the needed seeds to Rwandans, but its research and technical knowledge of plants and farming systems allows its centers to provide this technical support to international relief agencies and NGOs. CGIAR will work in cooperation with NGOs, who will run the nurseries, transporting the tons of seeds into Rwanda and distribute them to farmers.

The program will go forward on the assumption that minimum stability will have been restored in Rwanda before the spring, 1995 planting season.

Rwanda's civil war and ethnic genocide resulted in the deaths of up to one million people and drove one half of the country's 7.9 million people away from their homes, many into exile in neighboring countries. Many of the most highly trained and experienced Rwandan scientists and agricultural technicians were among those who were killed or fled their land, which makes it more difficult for Rwanda to restore its agriculture on its own.

As a consequence, food production has been severely reduced in Rwanda, a country which was nearly self-sufficient in food before the civil war. The 1994 troubles have led to a loss of some 60 percent of the harvest of cereals and of pulse crops (mainly beans), and the loss of some 30 percent of plantains, roots and tuber crops, with even worse projections for next year, unless seeds are delivered. The endangered crops normally provide 80 percent of calories and protein in the Rwandan diet.

Before the civil war, 91 percent of the economically active population of Rwanda were engaged in agriculture, one of only four countries in the world in which more than 90 percent of the people worked in agriculture (The others are Nepal, Burundi and Bhutan).

A drought in 1993 led to a crop shortfall of some 30 percent by the end of the growing season in January of this year, before the civil war began.

The main initial focus will be to increase seed supplies of beans, sorghum and maize. Thirty-five major varieties of beans are being reintroduced into Rwanda, while 250 additional local varieties, along with some breeding lines that have been tested in the past, will continue to be tested. CGIAR is also reintroducing a number of sorghum varieties sufficient to restore production of this crop.

With other crops -- mainly potato, sweet potato and cassava -- the planting material has to be produced domestically inside Rwanda, because of its bulk. Therefore, clean planting material and the ability to multiply that seed domestically is an important component in the **Seeds of Hope** initiative.

Seeds of Hope Action Plan

The main genetic resources will come from the following CGIAR centers -- CIAT (beans), CIP (sweet potato, potato), ICRISAT (sorghum), CIMMYT (maize), IITA (cassava and plantain), ICRAF (trees), and ILRI (multiplies seeds from other centers). Another participating center, IPGRI, has wide experience in genetic resources. Other CGIAR centers are supporting and will participate in the initiative.

Each of the target crops has a different growing season, conditions and multiplication rates:

- Beans, sorghum and maize are the main crops in Season A, from September to January;
- Sorghum is the main crop in Season B, February to July, but beans and maize are also planted;
- Season C, from July to September, is a dry season and allows the cultivation of a third crop;
- Root and tuber crops (potato, sweet potato and cassava), and plantain are cultivated year round.

Seeds are packaged in Ag Paks (250 gram --approximately 1/2 pound--packet of seeds) for distribution to farmers in Rwanda and are distributed by relief agencies and NGOs. These Ag Paks are distributed to the farmers along with basic farming implements and food aid rations so that the seeds are planted and not eaten.

CGIAR Centers will prepare and distribute technical information to relief agencies and NGOs, indicating names of adapted varieties, likely sources near Rwanda, and procedures to ensure high seed quality and seed cleanliness.

Rebuilding of agricultural research capacity in Rwanda will be aimed at reestablishing crop production and reintroduction of diversity during this initial phase. The mechanism will be installed through training courses and workshops, utilizing existing networks.

There is already considerable knowledge about the crop diversity that existed in Rwanda before the civil war. In some cases, especially regarding beans and sorghum, good though small collections exist that represent pre-civil war diversity. Both socio-economic and genetic approaches employing conventional and molecular techniques will be used to assess diversity in Rwanda immediately after the civil war and during the course of reestablishing diversity.

The outcomes and benefits of **Seeds of Hope** are expected to be:

- Restoration of domestic food production and alleviation of starvation;
- Rapid restoration of adapted varieties and seeds to Rwandan farmers;
- Re-establishment of seeds biodiversity;
- Early re-establishment of agricultural development programs with the Institute of Sciences of Rwanda, relief organizations, NGOs and national programs of neighboring African countries;
- Resettlement of Rwandan farmers;
- Reduction in cost of externally supplied food aid;
- Protection of previous investment in developmental research;

- Analysis of the impact of reestablishing crop diversity;
- Establishment of an emergency response capacity in the CGIAR for even quicker response, in case of future crises.

Future follow-up developments will consolidate the results of the early reintroduction of varietal diversity, including monitoring the increase or decrease in genetic diversity.

A retraining program will be essential in the early stages of the follow-up activities to replace the Rwandan scientists and agricultural technicians who were victims of the civil war. CGIAR will also seek to assist in reestablishing national agricultural research programs in Rwanda and link them to agricultural networks with sister countries in the region.

CGIAR will seek to assist Rwanda and neighboring countries in establishing regional food security to mitigate future disasters, either from civil strife or natural disasters. This will require limited seed storage facilities located in several countries and a regional seed industry capacity.

Consolidation of this initial phase by longer term follow-up is aimed at assisting in the creation of a comprehensive approach to sustained food production and overall development in Africa.

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Cassava



Potato



Plantain



Sorghum